

Wide-Bandwidth, Ultra-Accurate, Composite Inertial Reference Sensor, Phase I

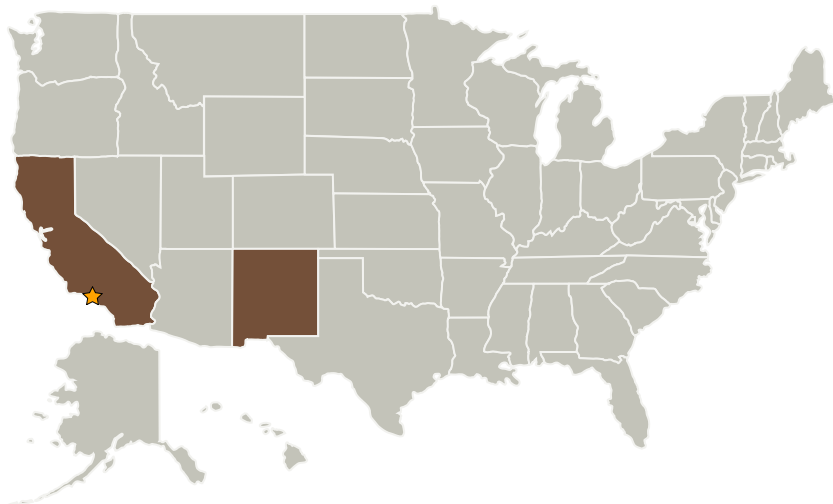
Completed Technology Project (2006 - 2006)



Project Introduction

Applied Technology Associates (ATA) proposes to develop a new inertial sensor by combining two sensing phenomena in a single device. ATA has patented an advanced inertial sensing technology based on magnetohydrodynamics (MHD). Numerous researchers have patented and developed micro-electromechanical sensors (MEMS) that measures inertial angular motions. We believe that a composite sensor based on the best characteristics of both of these technologies is a promising new advancement. Our innovation is denoted the Hybrid Sensor (HYSENS) owing to its origins in two distinct inertial angle rate sensing principles. The MHD technology offers wide bandwidth, high sensitivity, with reasonable size and power. The MEMS offers small size and power. Initial analysis done by ATA and our MEMS technology partners indicates that it is possible to achieve performance goals that are at or near the state-of-the-art for inertial reference sensors. The proposed composite sensor fulfills the need for lightweight, compact, high-precision, high-bandwidth (0-2KHz) inertial reference sensors for use onboard spacecraft with optical communications payloads. The predicted noise performance for HYSENS is less than 0.1 microrad. Volume for this advanced sensor is expected to be under 2 cubic in; its weight under 150 grams; and its power draw under 200 mW.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

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Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	New Mexico

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
 - └ TX17.2 Navigation Technologies
 - └ TX17.2.3 Navigation Sensors